

MARINE REVIEW.

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No. 14.

Bitter Competition for Insurance.

It is estimated that in two or three days of the past week \$1,000 was expended on cablegrams between Cleveland and London, on account of the struggle for hull insurance between Johnson & Higgins of New York and the new syndicate headed by Charles E. & W. F. Peck of New York and Chicago. The fight for insurance of big steel fleets in Cleveland, like those of the Bessemer Steamship Co., Pickands, Mather & Co., American Steel Barge Co. and others was very bitter. The Peck & Peck combination has taken a very large amount of insurance, including, it is said, the Lake Superior Iron Co's fleet, as well as other vessels controlled by Messrs. W. D. Rees, Harvey H. Brown and others of Cleveland, and some of the Buffalo line boats, but it was announced yesterday on good authority that Johnson & Higgins had secured the Bessemer fleet. The struggle for the Rockefeller boats evidently caused a great deal of ill feeling, and it may be put down as certain that the rate made on them was very low. R. Bleeker Rathbone of the firm of I. C. Rathbone & Co., a strong New York insurance house, which has extensive dealings with the Standard Oil Co. and with leading capitalists connected with that corporation, came to Cleveland with a view to securing the Bessemer insurance for the new combination. The head of the firm of Rathbone & Co. is president of the National Standard, one of the insurance companies that is in the new pool. It is understood that insurance on a number of the large fleets, including those managed by Pickands, Mather & Co., has not as yet been placed. Weed & Kennedy, another large firm of New York brokers, have also had a representative looking into the lake business. Information regarding the rate made on steel steamers is carefully guarded, but it is thought to be little if anything below 3 per cent., excepting in special cases where the largest lines were involved. Thus far the general agents who have controlled lake business in the past seem to be unable to compete with the brokerage combinations, and local agents are very much discouraged over the loss of business that has formed a large share of their profits each year.

Buffalo Elevator Situation.

Although it is quite certain that the big elevator interests of Chicago—especially Armour & Co. and Counselman & Co.—are preparing to extend their operations to Buffalo and Erie, as well as New York and other sea ports, in order to reduce transfer charges and keep grain from going to southern routes, the full force of the changes contemplated by the Chicago interests will not be felt during the coming season. The Buffalo pool, known as the Western Elevating Association, has been holding meetings almost daily during the past week, but their immediate differences are of a kind that have been coming up every year of late. They relate to an apportionment of the shares of the pool for the coming season, and will probably be settled by the formation of an 1897 pool along the lines of past years, but another year will present an entirely different condition of affairs, and one which will probably result in the overthrow of the pool.

Two new elevators are now planned at Buffalo. One of them, the so-called Great Northern-Armour elevator, is well under way. The other is to be built by Kneeland & Co. of New York in conjunction with E. W. Eames of Buffalo. Plans for this latter elevator have been prepared, and although contracts have not been let it is more than probable that construction will be undertaken shortly. The location selected is above Ohio street bridge, where the draft of water is now limited, but it is expected that river improvement work to enable vessels to reach that point will be completed by the city about the time that the elevator is ready for business. These two elevators will add about 25 per cent. to Buffalo's present elevator capacity. The capacity of the Great Northern-Armour elevator will be fully 2,000,000 bushels while that of the Kneeland-Eames house will be about 800,000 bushels. The latter is to be of steel, also, and will be constructed on a principle of circular bins that is said to insure minimum cost of handling grain. Kneeland & Co. are large grain receivers in New York, and have

for a long time past held close business relations with E. W. Eames, who is also one of the best known grain men of Buffalo. There has been some talk also of the Erie Railway Co. building an elevator at Dunkirk, but there is nothing tangible about this rumor, which is probably prompted by the idea that some advantage would be taken of the large harbor improvements that will soon be undertaken by the government at that point.

But after all, it must be understood that little if anything in the way of important changes on account of these elevator projects can be expected this year. The big elevator now under way at Buffalo can not be completed until the latter part of the season. Its construction will involve an outlay of nearly half a million dollars, and no small part of this will be on account of the foundation, which is now being built. A space of about 120 by 400 feet is being filled with piles, which will be driven to rock at an average depth of about 70 feet. On top of this mass of piling there will be a masonry foundation for the steel structure, which will be about 70 feet high and contain thirty tubular bins of 30 feet diameter and eighteen tubular bins of 15 feet 6 inches diameter. There will be three legs with a working capacity of about 25,000 bushels an hour.

Lake Freight Matters.

Representatives of Lake Superior mining companies other than those of the Mesabi range are still engaged in daily meetings at Cleveland, and it is said that their work of arranging details for a pool on old range ores will continue for a week or more to come. There is, accordingly, nothing to report regarding the ore sales market and no negotiations with vessel men regarding freight contracts. Notwithstanding the report that Mr. A. B. Wolvin of Duluth had entered into a contract for the transportation of about 425,000 tons of ore from Escanaba to Milwaukee, Chicago and South Chicago, it is now announced from Chicago that the representatives of the Illinois Steel Co., who asked for bids on this ore, are not ready to make the contract. They claim that they can have the ore moved at a price a little below 25 cents. There are no unloading charges, and it is probable that the ore will be carried to a large extent without trimming.

It is quite evident that stocks of hard coal, both at the head of Lake Superior and in Chicago, are much larger than was expected. From the best information to be had among Buffalo dealers, it is estimated that there will be carried over at the opening of navigation this season about 900,000 tons of hard coal on docks at western lake ports, as against 400,000 tons a year ago, with no demand in the west for hard coal, and the property on the docks taxable on May 1. From this it would seem that there will be but little disposition to ship coal before May. Chicago advices are to the effect that vessels have been offered for several days past at 1½ cents on corn to Buffalo, but that there is no demand for tonnage in either the Buffalo or Kingston trade.

Indications of Higher Water.

A letter from Mr. E. S. Wheeler, general superintendent of the St. Mary's Falls canal, says that the present stage of water, both above and below the locks, is almost exactly the same as it was last year at this time. It is, of course, entirely uncertain as to whether the stage of water will continue until the opening of navigation to correspond with last year or not, but if such is the case the draft through the Sault river on the opening will be within a small fraction of 16 feet. The shallowest point now in St. Mary's river is in the Middle Neebish opposite the dike.

Reports from Detroit river are to the effect that the water in the vicinity of Ballard's reef, where the shoalest spots are to be found, is about 9 inches higher than it was at this time a year ago.

Col. Wm. Ludlow, corps of engineers, United States army, has succeeded Col. G. L. Gillespie in charge of harbor work at New York.

About \$2,500 has been expended in putting a new deck, new rail, etc., on the barge Kingfisher during the winter.

Improvements in the Construction of Lake Vessels.

By John Haug, Engineer and Naval Architect, Philadelphia.

Having been engaged during the season of 1896, in supervising the construction of some of the Bessemer Steamship Co.'s vessels, and having at the same time many opportunities to observe the construction of other lake vessels, it appeared to me that there were two points in their general construction that were susceptible of improvement, both resulting from the very wide hatches necessary

of a section of the steamer Sir Henry Bessemer shown in Fig. 1, and give the following results:

Full area of section.....	1633.4 square inches
Effective area (for hogging strains)...	1580.7 square inches
Neutral axis above base line	9.86 feet
Neutral axis below top member	18.64 feet
Moment of inertia of section	184,089 foot inches
14 feet draft: Displacement (estimated).....	6300 tons
Bending moment (estimated).....	64890 foot tons

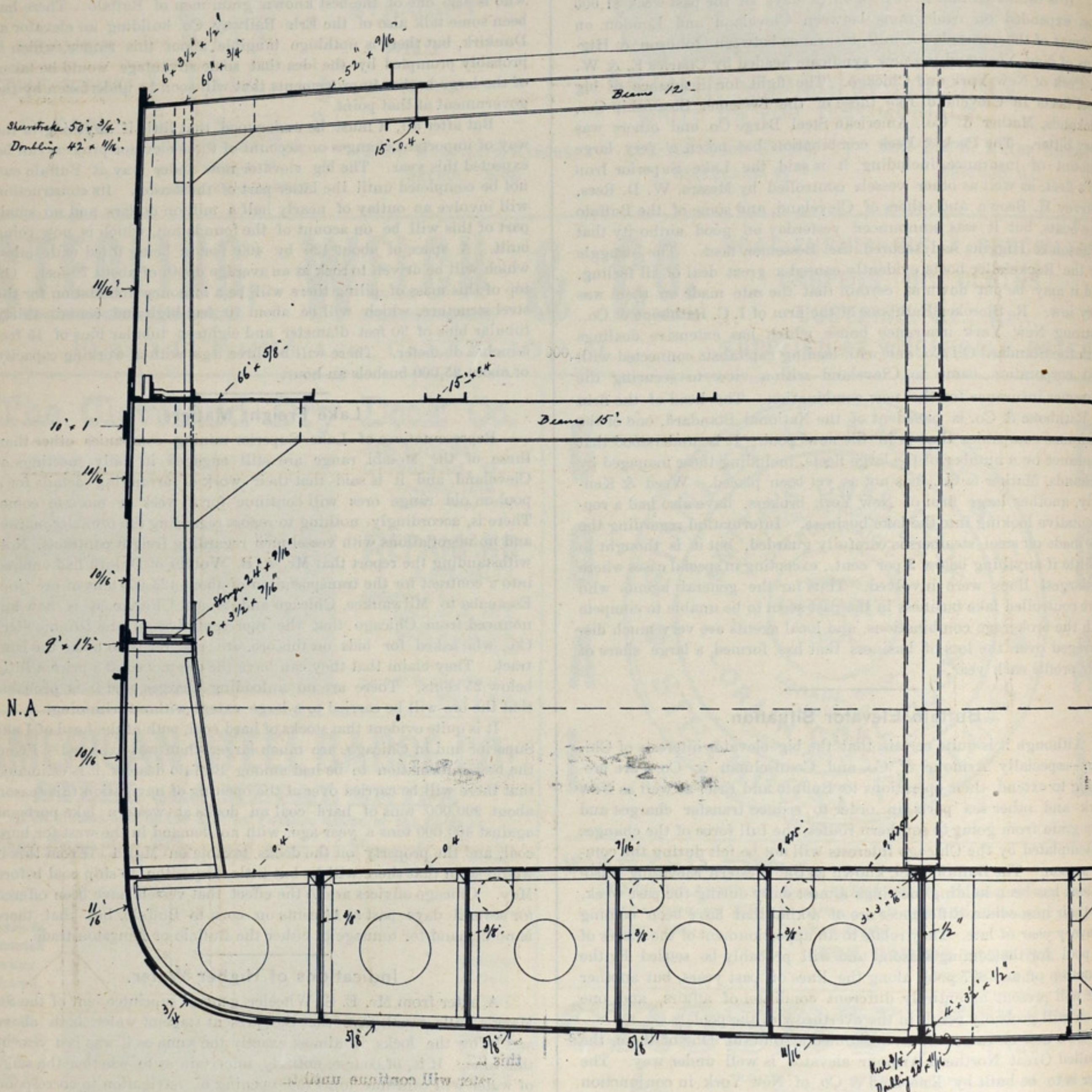


FIG. 1. MIDSHIP SECTION OF LAKE FREIGHT STEAMER SIR HENRY BESSEMER.

Length on keel, 412 feet; beam, molded, 48 feet; depth, molded, 28 feet.

to handle the cargo quickly, which cut away the greater part of the deck, thereby also rendering the connection between the two sides insufficient to properly resist the very complex strains, to which vessels laboring in a heavy sea are so frequently subjected. It is well known that some vessels have succumbed to these strains, and even the stronger class of vessels show considerable vibration at times. It may therefore be interesting to find how much strain the material is really undergoing, and how much this would be increased when a greater depth of channel will permit lake vessels to be loaded to 18 feet draft. For this purpose I have calculated the moment of inertia

$$\text{Strain, top: } \frac{64,890 \times 18.64}{184,089} = 6.57 \text{ tons per square inch}$$

$$\text{Strain, bottom: } \frac{64,890 \times 9.86}{184,089} = 3.48 \text{ tons per square inch}$$

18 feet draft: Displacement (estimated) ... 8400 tons

Bending moment (estimated) 82400 foot tons

$$\text{Strain, top: } \frac{82,400 \times 18.64}{184,089} = 8.34 \text{ tons per square inch}$$

$$\text{Strain, bottom: } \frac{82,400 \times 9.86}{184,089} = 4.414 \text{ tons per square in.}$$

When it is considered that the above strains change from tension to compression about ten to twelve times per minute while a vessel passes from the crest to the trough of the wave, it must be recognized that some vessels only survive because they never encounter conditions producing such extreme strains. But as there is no certainty that any vessel may not encounter these strains at any time, it may be worth while to consider some improvements in construction herewith submitted, by which, without increasing the weight, superior strength and rigidity of construction may be obtained.

Fig. 2 is a section of a vessel of exactly the same size as the Sir

nected, by the usual diamond plates, to vertical fore-and-aft stringers, riveted under the ordinary deck beams, and attached to deck plating by intercostals, the entire construction forming a strong and rigid system of framing, connecting the two sides for united action against all strains, however complex they may be. The calculations of this section give the following results:

Full area of section.....1610.1 square inches
Effective area (for hogging strains)....1537.2 square inches
Neutral axis above base line.....11.6 feet
Neutral axis below top member.....16.7 feet

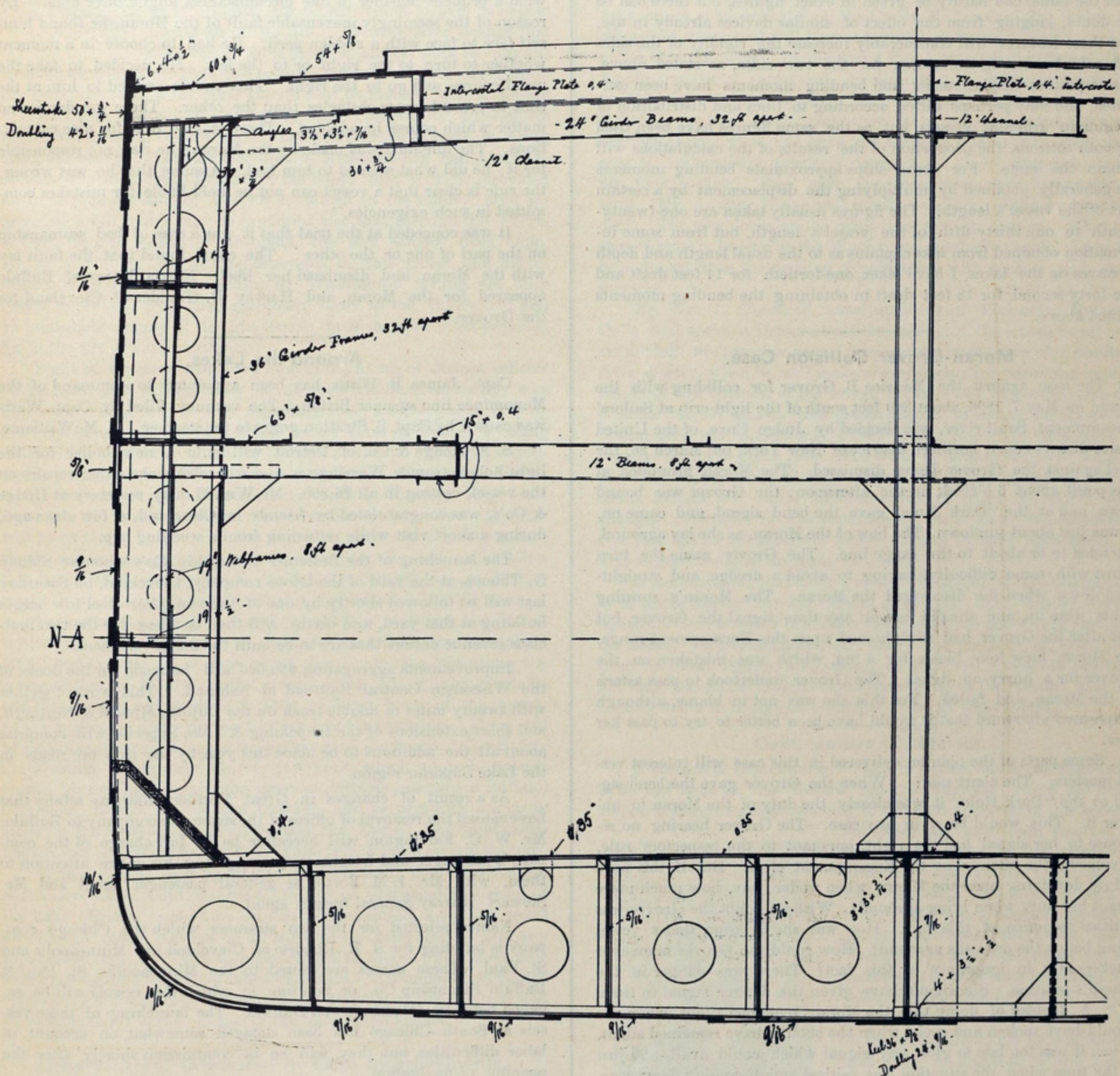


FIG. 2. MIDSHIP SECTION OF LAKE FREIGHT STEAMER WITH DEEP GIRDER.

Length on keel, 412 feet; beam, molded, 48 feet; depth, molded, 28 feet.

Henry Bessemer, showing additional material at the top in the form of shelf plates, riveted under the beams. These not only give the required increase in material in the top members of the structure, but also give additional bracing to the deck frame, securing the same against racking strains, etc. The usual belt frames are fitted, to obtain a good stiffening of the sides, but a further increase in the same direction is secured by fitting extra deep girder frames, spaced 32 feet, thus having two ordinary belt frames between them. To obtain a better connection of the two sides, these extra strong girder frames are combined with extra deep deck beams, which are also firmly con-

Moment of inertia of section.....200,177 foot inches

Displacements and bending moments same as for Figure 1

14 feet draft: Strain on top: $\frac{64,890 \times 16.7}{200,177} = 5.48$ tons per square inch

Strain, bottom: $\frac{64,890 \times 11.6}{200,177} = 3.76$ tons per square inch

18 feet draft: Strain on top: $\frac{82,400 \times 18.64}{200,177} = 6.96$ tons per square inch

Strain, bottom: $\frac{82,400 \times 11.6}{200,177} = 4.775$ tons per square inch

Thus, while the area of section is slightly less in the modified construction, the strain on the extreme top member is reduced 16.6 per cent., while the strain on bottom is only increased 8 per cent. and is still considerably smaller than the strain on top members. It will be observed by looking over the above calculations that the additional material placed on top becomes useful, not only by the increase in area, but also by raising the neutral axis of the section, thus decreasing the leverage of the strains on the top members. The increase in strength gained by the addition of the extra deep girder frames, the deep beams, fore-and-aft stringers under beams, etc., in connection with the same, can hardly be given in exact figures, but there can be no doubt, judging from the effect of similar devices already in use, that these features will considerably increase the rigidity of the sides and afford a strong connection for the two sides, as stated above. The respective displacements and bending moments have been estimated, and may perhaps differ, according to lines and distribution of weights in different vessels, but as the same figures have been used for both sections, the proportion of the results of the calculations will remain the same. For ocean ships approximate bending moments are generally obtained by multiplying the displacement by a certain part of the vessel's length. The figures usually taken are one-twenty-eighth to one-thirty-fifth of the vessel's length, but from some information obtained from lake captains as to the usual length and depth of waves on the lakes, I have taken one-fortieth for 14 feet draft and one-forty-second for 18 feet draft in obtaining the bending moments quoted above.

Moran-Grover Collision Case.

The case against the Maurice B. Grover for colliding with the Moran on May 7, 1896, about 300 feet south of the light crib at Sailors' Encampment, Sault river, was decided by Judge Coxe, of the United States district court, northern district of New York, on March 26, the libel against the Grover being dismissed. The Moran grounded at this point about 5 o'clock in the afternoon; the Grover was bound down, and at the "Dark Hole" gave the bend signal, and came on. It was just about sundown. The bow of the Moran, as she lay aground, extended to or about to the range line. The Grover made the turn above with some difficulty, having to avoid a dredge, and straightened down when she discovered the Moran. The Moran's running lights were up, and she did not at any time signal the Grover, but just after the Grover had straightened upon the Encampment range, the Moran blew four blasts for a tug, which was mistaken on the Grover for a hurry-up signal. The Grover undertook to pass astern of the Moran, and failed. For this she was not to blame, although it appeared afterward that it would have been better to try to pass her bow.

Some parts of the opinion delivered in this case will interest vessel masters. The court said: "When the Grover gave the bend signal at the 'Dark Hole' it was clearly the duty of the Moran to answer it. This would be so in any case. The Grover hearing no response to her signal had the right, pursuant to the inspectors' rule, to consider the channel at the Encampment clear. But if this were a duty devolving upon the Moran when under way, how much more was it her duty when lying aground? Without doubt the Grover was entitled to notice of this fact. How was she to know that a vessel lying below the crib was aground? How could the Grover maneuver intelligently in ignorance of this fact? There was danger in the Moran's position. She should have given the danger signal in time. * * * Instead of doing this, the Moran remained silent when she should have spoken and spoke when she should have remained silent. When it was too late to give any signal which could avail, and just at the time when the situation was critical and becoming dangerous, the Moran gave four blasts upon her whistle. This was intended as a call for assistance from the tug. But if the blasts were short, and they may well have been curtailed in the excitement of the moment, the signal was an invitation to the Grover to 'come on,' to 'hurry up.'" It was so understood by the master of the Grover. It is not important to inquire whether the Grover was justified in mistaking the signal. The Grover was so near at the time that it was impossible for the tug to render any assistance before the Grover passed. The Moran should have waited until the danger was over before complicating still further an already hazardous situation by a premature and misleading signal. The problem confronting the Grover was difficult enough without adding a new element of uncertainty. To give an unneces-

sary signal at such a time, which might be construed into a request to do the worst thing possible, was a grave fault."

As to the navigation of the Grover, the court said: "It is manifestly unfair to judge the Grover in the light of the situation as it is now developed. The judge should endeavor, as far as possible, to place himself in the position of the master of the Grover and pass judgment upon his action in the light of what was known at the time. * * * The question is not whether the Grover adopted the best possible course, but whether she adopted the best course in the sudden exigency which confronted her. Did the master of the Grover do what a prudent mariner in like circumstances might have done? By reason of the seemingly inexcusable fault of the Moran, he found himself face to face with a sudden peril. He had to choose in a moment whether to turn to the right or to the left. He decided to take the usual course and go to the right. This course seemed to him at the time to present fewer obstacles than the other. There was danger no matter which course he adopted. There was no time for nice calculations. The dilemma was made by the Moran; he was not responsible for it; he did what seemed to him best. Assume that he was wrong; the rule is clear that a vessel can not be held liable for mistakes committed in such exigencies."

It was conceded at the trial that it was a case of bad seamanship on the part of one or the other. The court found that the fault lay with the Moran, and dismissed her libel. Norris Morey of Buffalo appeared for the Moran, and Harvey D. Goulder of Cleveland for the Grover.

Around the Lakes.

Capt. James B. Watts has been appointed to command of the Menominee line steamer Briton. The vacancy filled by Capt. Watts was caused by Capt. S. Stratton going to the steamer J. J. McWilliams.

S. F. Hodge & Co. of Detroit will build a new boiler for the light house steamer Warrington and will also make other repairs on the vessel, costing in all \$6,800. Mr. Wm. M. Kay, secretary at Hodge & Co's, was congratulated by friends in Cleveland, a few days ago, during a short visit while returning from a wedding trip.

The launching of the Bessemer Steamship Co's schooner Sidney G. Thomas at the yard of the Globe company, Cleveland, on Saturday last will be followed shortly by one of the two other steel tow barges building at that yard, and berths will then be clear for the two first-class revenue cutters that are to be built for the government.

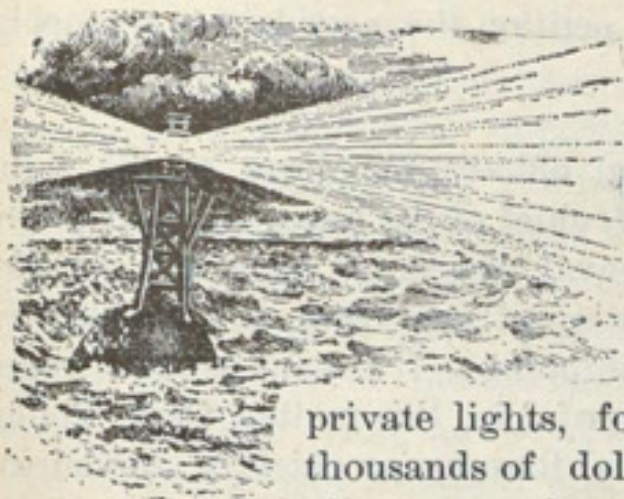
Improvements aggregating \$50,000 will be made on the docks of the Wisconsin Central Railroad at Ashland. This work, together with twenty miles of double track on the Duluth, Missabi & Northern, and short extensions of the Ishpeming & Lake Superior will comprise about all the additions to be made this year by the iron ore roads in the Lake Superior region.

As a result of changes in Great Northern Railway affairs that have caused the removal of offices of the steamship company to Buffalo, Mr. W. C. Farrington will hereafter be in full charge of the company's passenger and freight steamers, giving his entire attention to them, with Mr. I. M. Bortle as general passenger agent and Mr. Stewart Murray general freight agent.

Names selected for the two steamers which the Chicago company is building for R. R. Rhodes of Cleveland are Minneapolis and St. Paul. These names are suited to the Minneapolis, St. Paul & Buffalo Steamship Co., or Soo line, in which the vessels will be engaged between Gladstone and Buffalo. The launching of these vessels at South Chicago has been delayed somewhat, on account of labor difficulties, but they will be in commission shortly after the opening of navigation.

Contracts have been awarded for some parts of the Cleveland Ship Building Co.'s new plant at Lorain. The main steel house for the ship yard will be 250 feet long and 100 feet wide and will be erected by the New Columbus Bridge Co. Two seven-ton ship cranes, electrically driven and of 58 feet span, will be furnished by the Brown Hoisting & Conveying Co., and two seven-ton shop cranes, 40 feet span and electrically driven, by the Morgan Engineering Co. of Alliance, O. A Scotch boiler 11 by 12 feet and a return tubular boiler 6 by 16 feet will be built by the owners of the plant at their Cleveland works. Two centrifugal pumps for the new dry dock, each of 26,000 gallons capacity, will be furnished by the Southwark Foundry & Machine Co. of Philadelphia.

Gas Buoys for all Parts of the Lakes.



Before the coming season of navigation is at an end there will be in different parts of the lakes about forty-three gas buoys, marking shoals and dredged channels, and in many cases taking places occupied by private lights, for which vessel owners have paid thousands of dollars. It may seem strange that after two or three years of active work in congress without securing more than two or three of these aids to navigation the vessel interests of the lakes should now be favored with a supply of these buoys that will in one season meet practically their entire needs, but there have been a great many influences at work to bring about the change. Senator McMillan of Michigan has had much to do with securing a large number of the buoys that will be provided for in an appropriation of \$25,000 contained in the sundry civil appropriation bill, but it may be explained also that through the efforts of Capt. Geo. P. McKay of Cleveland, the new senator from Ohio, Mr. M. A. Hanna, has become interested in this matter, and his influence with department officers at Washington insures not only liberal treatment from the light-house board in the future, but also an immediate supply of the gas buoys in advance of those provided for in the \$25,000 appropriation.

Eight of the new buoys are now in the hands of district officers on the lakes and will probably be at their stations before the lake fleet begins to move. Notices regarding them are being sent out by the inspectors, and the light-house tender Haze at Detroit is being fitted with a gas storage plant for the care of them. The first installment of eight buoys will be located as follows: Three at Ballard's reef, Detroit river; one at inner cut, entrance to Maumee bay, Lake Erie; two at Poverty passage, entrance to Green bay, one of which will be on Gravelly island shoal and the other on Poverty island shoal; one on Lansing shoal, as a substitute for the red second-class nun buoy, which has heretofore marked this danger; one at Fisherman's shoal, to the eastward of Washington island, Lake Michigan.

Following the establishment of this first lot of buoys, the Detroit station will receive four more of them about April 20, five more about May 1 and another lot of five about July 1. In the meantime the appropriation of \$25,000 in the sundry civil bill will be available and this money will provide at least eighteen more of the buoys, which will come along during the season of navigation. There will be no difficulty regarding the maintenance of the buoys. The Safety Car Heating & Lighting Co. of New York, which controls patents on the Pintsch lights, maintains gas manufacturing stations at Buffalo, Cleveland, Toledo, Detroit, and Chicago, and preparations are being made for the erection of a plant at Sault Ste. Marie. The light-house tenders can secure gas for the buoys from any of these several stations.

With a view to treating all lake interests fairly in the distribution of the new buoys, Capt. George P. McKay of Cleveland, chairman of the Lake Carriers' committee on aids to navigation, asks that vessel owners and vessel masters in all parts of the lakes send to him any suggestions they may have to make regarding places where these new aids to navigation will be of most assistance. All suggestions will be appreciated and carefully considered in making up the list that will be recommended to the officials of the light-house service.

General Alger Interested in Lake Improvements.

It is quite evident that Gen. Alger, the new secretary of war, will give personal consideration to matters pertaining to the improvement of channels in connecting parts of the lakes. From vessel men who have talked with him since he accepted the position of secretary of war, it is understood that he favors appropriations that will enable the government engineers, to increase to full 800 feet, the width of all channels in the St. Clair and Detroit rivers between Lake Huron and Lake Erie. An idea of the importance of this work, if it is undertaken, may be gained from the fact that under such a plan of increased width of channels the Lime-Kilns cut would be almost doubled in width. Upon suggestion from Gen. Alger, Capt. Geo. McKay, Secretary Keep and Mr. W. C. Richardson of the Lake Carriers' Association are now in Detroit conferring with Col. Lydecker on the subject

of limiting the speed of vessels running through the new thirteen-mile cut at Grosse point. If it is found, upon investigation, that the wash from the propeller wheels is filling the cut, the speed of vessels will probably be limited to about nine miles an hour loaded and eleven miles light, and an effort will be made anyhow to have the old channel at this point staked and lighted, so that it may be used by up-bound vessels and by the river passenger steamers.

Fueling Docks.

With the opening of new docks on the Sault river, next month, for supplies of steamboat fuel, the Cuddy-Mullen Coal Co., miners and shipper of steam coal will have a business pretty well spread over the entire chain of lakes. In Cleveland they have a car dumping machine for the transfer of cargo coal, in addition to eight steamboat fueling pockets of 1,000 tons capacity, three steam derricks and a fueling lighter. On the Detroit river they have ten pockets and two steam derricks at Sandwich, and have just acquired a lease of the dock property at Amherstburg, formerly operated by O. W. Shipman, which has four pockets. They have also three steam derricks at Amherstburg. Mr. Andrew Welsh will remain in charge of the Amherstburg dock. The new docks on the Sault river are at Detour. They are those formerly known as the Watson and Anthony docks. They will be equipped upon the opening of navigation with pockets and steam derricks.

Mr. Wm. L. Sherwood, superintendent of Pickands, Mather & Co.'s coal docks at Detour, has been calling on Cleveland vessel owners during the past few days, preparatory to leaving for the Sault river shortly, when he will make arrangements for beginning another season of fuel business at the Detour docks. Mr. Sherwood says that of about 60,000 tons of coal placed aboard vessels at his company's Detour dock last season only a very small proportion was taken by vessels bound to Lake Erie. The trade is almost entirely with ore carriers bound to Lake Michigan from Lake Superior, and on this account Detour will be an important fueling point no matter what changes may occur in the condition of Sault river improvements. His dock has an advantage, of course, in deep channel approaches, as well as deep water at the dock.

It is understood that dealers in steamboat fuel at Cleveland have fixed prices for the coming season at \$2 from dock and \$2.10 from lighters. This is about 15 cents a ton lower than prices that prevailed last season. It is understood, also, that a uniform price of \$2.10, both from dock and lighter, will prevail at Fairport, Ashtabula and Erie, but there are some disagreements among all of the dealers that are causing doubt as to the maintenance of any of these prices.

Capt. James W. Martin.

A portrait of Capt. James W. Martin, whose death was announced in the last issue of the Review, appears herewith. Since his death several communications referring to the high character of this successful vessel man have been received by the Review. One of the correspondents, who had known Capt. Martin from his early sailing days, says of him: "He was a man of education, having graduated from the St. Louis University, and therefore had an advantage over most men following the lakes, but his good fortune in this regard did not cause him to lose interest in the men with whom he was associated when he first took to the lakes. Several of them were advanced with him in the employ of the Flint & Pere Marquette Co. In his youth he did not enjoy good health, and finding that sailing benefitted him, he chose that occupation. He was successful for the reason that he was possessed of many forcible traits of character, the principal of which were fidelity to duty and the power of winning the confidence of men above and below him in position by fair treatment and honesty in all matters."



Capt. Sigsbee, chief of the hydrographic service, who has been ordered to sea duty by the secretary of the navy, does not leave the hydrographic office until April 19.

The Review has excellent photographs of lake ships.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,792	924,630.51
Sailing vessels and barges.....	1,125	354,327.60
Canal boats.....	416	45,109.47
Total.....	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
" " " 1896.....	117	108,782.38
Total.....	864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages.....	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered.....	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation.....	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about ¼ per cent. of the whole, but largely in American vessels.

Vessel owners of the lakes are showing no direct interest in the new tariff bill, although it would seem that there is a great deal in the measure as now proposed that is of considerable importance to them. Statistical reports from the treasury department show that during the year ending June 30, 1896, there was shipped into Canada from Ohio and Pennsylvania, by lake and rail, 3,045,965 tons of coal, of which 1,675,109 tons was bituminous and 1,370,856 was anthracite. A very large part of this coal, especially of the bituminous kind, was moved in vessels from Lake Erie ports, and the vessel interests should join the producers of Ohio and Pennsylvania in opposing an increase in the duty on coal. There is a good prospect that the Canadian government will reduce its duty on bituminous coal if our government shall not make an advance in its present duty. Then, too, it is understood that the imports of coal on the New England coast from the Cape Breton district and on the Pacific coast from the Vancouver district do not amount to more than 1,000,000, as against more than 3,000,000 tons going into the convenient market across the lakes from Ohio and Pennsylvania. The lake vessels interests should do all in their power to help the coal dealers of Ohio and Pennsylvania, who would be justified in asking for the entire removal of the duty on soft coal. But they do not do so. They simply ask that no advance be made in the duty, or that a reciprocal provision be made that our rate of duty on bituminous coal shall not exceed the Canadian rate of duty on the same article; and that in the event of a reduction of the duty by the Canadian government, our rate of duty shall be equalized with theirs.

Candidates for the office of commissioner of navigation are now quite numerous. Capt. Daniel McLeod, whose name is mentioned in connection with the office in a communication elsewhere in this issue, will certainly secure the support of acquaintances among vessel owners on the lakes, and it may be noted that his friends are as numerous in Chicago, Milwaukee, Buffalo and other lake cities as they are in Cleveland. It is unfortunate that there are three candidates from lake states—Wm. W. Bates, Frank A. Flower and Capt. McLeod. In the east, and especially in Philadelphia and New York, an effort is being made to retain Mr. Chamberlain, on account of the excellent manner in which he has attended to the duties of the office. The Philadelphia Maritime Exchange adopted resolutions a few days ago declaring that, although it has been the custom of the exchange scrupulously to avoid making recommendations for appointments to pub-

lic office, Mr. Chamberlain's excellent fitness for the office of commissioner of navigation impelled the members to depart from their time-honored practice, and to earnestly petition the president to re-appoint him to the commissionership.

The competition among naval officers for places on the light-house board and for the position of chief of the bureau of navigation is attracting attention outside of naval circles, on account of the wide influence of the light-house institution of late years, and the close relation which it bears to merchant shipping. If the influence of representatives of lake interests is successful in this matter, Capt. Robley D. Evans will succeed Rear Admiral Ramsay as chief of the bureau of navigation and Commander Gridley will probably be one of the officers appointed for service on the light-house board. The present naval secretary of the board, Commander Geo. F. F. Wilde, has made many friends among lake men who have had occasion to visit Washington, and if he can be retained on the board, even beyond his present term of duty of this kind, the lake interests will be greatly pleased.

At a meeting to be held in New York in a few days representatives of the principal Atlantic steamship companies, as well as the eastern ship builders, will decide upon plans to be adopted with a view to securing action in the present congress relative to some measure of assistance for the American merchant marine. Representatives of leading commercial organizations of the country will attend the meeting, and President Griscom of the International Navigation Co. will very probably be the presiding officer. Messrs. F. J. Firth of Philadelphia and Charles H. Keep of Buffalo will represent the Lake Carriers' Association, but it is not probable that Mr. Goulder, the third member of the committee, can attend. It is understood that ex-Senator Edmonds has been selected to represent the shipping interests in their dealings with the new congress.

Senator McMillan of Michigan has introduced a bill in congress authorizing the Northern Michigan Railway Co. to construct a bridge across Portage lake and one of the canals of the Portage district on plans approved by the secretary of war. As the Portage lake canals are owned by the government and entirely in charge of the war department, it is not probable that the railway company will be permitted to construct a bridge that will prove a serious obstruction to navigation. The bill will not receive from the vessel interests the attention that has been given to the several Detroit river bridge measures, as the commerce of the Portage lake district is largely of a local nature, and the conditions are not at all like those presented at Detroit.

Capt. Gaskin, well-known vessel owner of Kingston, doubts the ability of the Canadian government to complete the St. Lawrence canal improvements, so as to provide 14-foot navigation through to Montreal within two years. Improvements on all of the canals excepting the Soulanges are practically completed, and rapid progress is being made on the Soulanges, but Capt. Gaskin says that after the canal work proper is finished a vast amount of rock blasting, dredging, etc., in channels outside the canals remains to be done, and he is of the opinion that it will be several years before this big job can be completed by any government.

Only the politicians will oppose the action of Secretary Alger in retaining Superintendent McKenzie at the St. Mary's Falls canal. The vessel masters of the lakes, who are most capable of appreciating the value of thorough methods in the management of the canal, were almost unanimous in asking for the retention of Mr. McKenzie. It is understood that Mr. Hanna, the new senator from Ohio, joined the Michigan senators in this move to eliminate politics from the management of the canal.

President Thwing of the Western Reserve University, Cleveland, writes in the April Review of Reviews on "How to Choose a College." His article deals with the practical questions likely to present themselves to students about to select a college home for four years, or to the parents of such students, and is characterized by the fulness of information and general breadth of view which have made President Thwing an expert on this and allied subjects for many years past.

Take the Nickel Plate road to Boston. Through sleepers from Chicago.

2 Mar 31

Affairs of the Lake Carriers—Wage Schedules.

Ex-President J. J. H. Brown of Buffalo, President James Millen of Detroit and Secretary C. H. Keep of Buffalo joined other executive officers of the Lake Carriers' Association in Cleveland, Tuesday, in a meeting at which several important matters pertaining to affairs of the association during the coming season were disposed of. It had been expected that a final report would be received from a committee appointed at the annual meeting of the association in Detroit to look after the question of grain shoveling charges at Buffalo, but Capt. Brown on behalf of the committee asked for further time. His report was of a kind, however, that indicated a thorough knowledge of the elevator situation, and the vessel owners have not by any means lost hope of a reduction in the shoveling charges.

In view of the unfavorable features of the present outlook for vessel business on the lakes during the coming season, this first meeting of the managers of the association was not marked by enthusiasm at the outset. Mr. B. L. Pennington proposed a postponement of action on wages and other important matters until such time as business of some kind was assured. Mr. M. A. Bradley said that he did not propose to do anything about starting his vessels until business in which there would be some profit was in sight. It had been proposed to reduce salaries of some of the officers of the association as well as the shipping masters. But a review of the finances of the organization would tend to indicate a condition somewhat better than that which existed a year ago, notwithstanding a deficit in the treasury. Private light expenses were to be reduced largely by assistance from the underwriters and by the use of gas buoys which the government is now furnishing to the lakes. It was therefore decided to make no changes in salaries of officers or shipping masters for the coming year. A. R. Rumsey will again have charge of the shipping offices with the following assistance: J. W. Hanson and Robert Anderson of Chicago; Maynard Fisk, South Chicago; William Lennon, Milwaukee; William Fletcher, Buffalo; Patrick Mitchell, Toledo; Daniel Harrington, Ashland; and Charles F. Wall, Cleveland.

On the question of wages of employes aboard vessels an important change is made as far as the issuance of schedules is concerned, although the general reduction is not as great as had been talked of among some of the owners. Hereafter steam vessels will be divided into three classes and three separate cards will be used. The steel steamers will be in the first class, large wooden steamers in the second class and the smaller class of wooden steamers in the third class. No division is made by tonnage figures, each owner being allowed to pass upon the question as to whether his vessel shall be regarded as of the first, second or third class, and to pay wages accordingly. The consorters are divided in two classes, with the understanding that the steel barges and the largest of the wooden ones shall be in the first class with all others in the second class. The full schedules of wages as they will appear on five cards are contained in the following table:

LAKE CARRIERS' SCHEDULE OF WAGES—ADOPTED AT
CLEVELAND, MARCH 30, 1896.

STEAM VESSELS.

	First class.	Second class.	Third class.
First engineers.....	\$105.00	\$90.00	\$60 to \$75
Second engineers.....	70.00	65.00	50
First mates.....	75.00	65.00	50 to 60
Second mates (when carried),	50.00	40.00
Firemen	30.00	30.00	25 to 30
Wheelmen	30.00	30.00	25 to 30
Lookouts.....	30.00	30.00	25 to 30
Deck-hands	15.00	15.00	15
Oilers (when carried).....	30.00
Cooks.....	50.00	45.00	40
Helpers	15.00	12.00

CONSORTS.

	First class.	Second class.
Mates.....	\$45.00	\$30 to \$40
Second mates.....	35.00
Cooks.....	30.00	25
Seamen	30.00	20 to 25

Nothing had been done since the annual meeting of the association by the committee appointed to confer with managers of Lake Erie ore docks on the question of unloading charges. It was agreed that an effort should be made to have these charges (now 16 cents) reduced, and the committee appointed at the annual meeting was increased by

three additional names—John Mitchell, H. A. Hawgood and W. H. Mack. Capt. Mitchell was chosen chairman of the committee. The question of reducing ore unloading charges rests with the heads of two or three of the leading ore firms of Cleveland. If a reduction is made, the greater part of it would, of course, come out of the labor and this might bring on trouble. There is considerable doubt about the charges being lowered. From the vessel man's point of view, it would certainly be best to have the reduction, if it is to be made, delayed until ore freight contracts have been entered into.

A View of Opening Conditions at Buffalo.

Buffalo, N. Y., March 31—Buffalo has made no changes in the ownership of vessels during the past winter and the package-freight lines will be about the same as last season, except that John Gordon's Great Lakes line will run four or more boats, as already announced. Some changes among the brokers are to be made. The firm of Boland & Co. will be composed of John J. Boland and Capt. Patrick Griffin, late of the Parnell. Smith, Davis & Co. are preparing to unite with John L. Crosthwaite in the brokerage business as a side issue to offset the active part taken by Brown & Co. in the Chicago end of the hull insurance split. There will be no change in the ship stores of account. The report that the Western line would open a store comes from the selection of a room at the company's warehouse for storage of supplies. The canal situation is the same. One boat has been built here and about a dozen at Tonawanda. The size of the boat for the enlarged canal is not yet determined, so that it is risky to build anything now. It looks as though the Wiman company would not materialize, at least this season. The canal will open as usual in spite of the lagging contract work.

Changes in the package freight lines are in the direction of shortening force here and sending the clerical work to New York to the respective railroad offices. W. J. Connors will have charge of the steward's department of the Western line and has retaken all his freight handling contracts at Buffalo, Chicago, Milwaukee and Gladstone. The threatened competition in the grain shoveling business has fallen through, but elevator rates are likely to decline, and there is no telling what effect this may have on the shoveling question. The excursion boats will still crowd about the foot of Main street, as the plans for straightening Buffalo creek and opening a south channel will hardly go through this season. The Northern line management may return to Buffalo, but this is not certain.

For Commissioner of Navigation.

Editor Marine Review:—The movement to have Capt. Daniel McLeod appointed to the position of commissioner of navigation should certainly meet with hearty approval from all lake interests. No one connected with lake shipping could be more consistently endorsed for the place. Starting first as a seaman before the mast on the Atlantic ocean, he advanced steadily until he attained command of seagoing vessels, and he was engaged on the Atlantic until 1867, when he came to the lakes and settled in Chicago, which at that time was a thriving and prosperous city, but had only 250,000 inhabitants. He opened up a ship yard in Chicago but was also engaged in sailing for some time after coming to the lakes. His first connection with the Inland Lloyds classification society was as a surveyor under Hon. W. W. Bates. When Mr. Bates resigned his position of chief surveyor in 1889, Capt. McLeod was elected to succeed him. He moved to Buffalo the following year to look after the publication of the register from that point, and remained in charge of the work until a few weeks ago, when it was practically decided to give up the old book, as far as general surveys are concerned, on account of the more elaborate publication that is now under way in Chicago. Thoroughly conversant with every detail of construction in ships and craft of all kinds, a practical navigator and ship builder, and fully capable of fulfilling the duties from the standpoint of hard-earned experience, it is to be hoped that Capt. McLeod's candidacy for the position of commissioner will be favorably considered. He comes from no one locality on the lakes but has had to do with the shipping interests everywhere on these waters, as well as on the Atlantic coast. Vessel Owner.

Cleveland, March 31, 1897.

In addition to a large number of orders from the coast, Thos. Drein & Son, Wilmington, Del., will furnish four life boats for a steamer building in Michigan, and two 22-foot boats for one of the freight steamers building at South Chicago.

Appointments of Captains and Engineers.

Langell & Sons, St. Clair, Mich: Steamer—Oscar T. Flint, Capt. Richard O'Connor, Engineer P. J. Merrill.

Wolvin, A. B., Duluth, Minn.: Steamers—Zenith City, Capt. F. P. Houghton; Queen City, Capt. H. L. Mills; Crescent City, Capt. F. C. Rae.

Lake Michigan Car Ferry Transaction Co., Peshtigo, Wis: Towing Steamers—J. C. Ames, Capt. Thomas Dunn; Crosby, Capt. Edward Evans; Raber, Capt. David Ramage.

Huron Barge Co., Pickands, Mather & Co., Mngr's, Cleveland: Steamer—Pathfinder, Capt. W. B. McGregor, Engineer C. A. Heisner; Schooner—Sagamore, Capt. E. Joiner.

Gray, R. T., Detroit: Steamers—John Owen, Capt. E. F. Thorp, Engineer S. L. Phillips; J. Emory Owen, Capt. M. Tinney, Engineer Martin Delaney. Sail—Michigan, Capt. F. J. Cadotte.

Cook, W. H. & Co., Vessel Agents, Chicago: Steamers—Thos. Davidson, Capt. James O. Wood, Engineer W. H. Beals; Walter Vail, Capt. John McAvoy, Engineer Dennis McMillan. Sail—Baltic, Capt. Thos. O'Donnell.

Berry, Wm. Port Stanley, Ont.: Steamers—Snowstorm, Capt. A. Brown, Engineer J. Brown; A. V. Crawford, Capt. H. Demmens, Engineer R. Wood. Sail—Groton, Capt. J. H. Christie; H. P. Merrie, Capt. T. Luches.

Inter Lake Co., Pickands, Mather & Co., Mngr's, Cleveland: Steamers Kearsarge, Capt. R. McDowell, Engineer T. Treleaver; Victory, Capt. J. P. Cottrell, Engineer D. A. Black. Schooner—Constitution, Capt. W. Holly.

United States & Ontario Steamship Navigation Co., A. C. Huidekoper, manager, Conneaut, O.: Steamers—Shenango, No. 1, Capt. R. R. McLeod, Engineer Geo. Collings; Shenango, No. 2, Capt. F. A. Dority, Engineer Wm. Elliott.

Minneapolis, St. Paul & Buffalo Steamship Co., Buffalo.: Steamers—Minneapolis, Capt. William Jameison, Engineer Bion St. Bernard; St. Paul, Capt. James Jackson, Engineer John Davidson; Nebraska, Capt. Peter Thompson, Engineer Joseph Taylor; Pridgeon, Capt. D. N. Sherwood, Engineer John Mogan.

Vulcan Transportation Co., Detroit: Steamers—Forest City, Capt. Joseph Sanders, Engineer Charles Harland; R. J. Hackett, Capt. Thomas Sanders, Engineer William Bridges. Schooners—H. H. Brown, Capt. Alex. Glenn; Wm. McGregor, Capt. John Hochrath.

Mills, John E., Port Huron, Mich.: Steamers—Argonaut, Capt. J. H. Warwick, Engineer —; N. Mills, Capt. C. H. Woodford, Engineer B. Hanson; H. J. Kendall, Capt. H. J. Kendall, Engineer E. Steger; T. R. Scott, Capt. Paul Rivard, Engineer —. Sail—Montgomery, Capt. Chas. Ludwig; Leader, Capt. G. N. King.

Dulac, Wm., Mt. Clemens, Mich.: Steamers—F. R. Buell, Capt. C. W. Woodgrift, Engineer John Deihl; Canisteo, Capt. W. J. Lynn, Engineer W. P. Boynton; A. Weston, Capt. M. Hyde, Engineer Ed Cottrell; C. A. Street, Capt. A. P. Gallino, Engineer Perry Cossairt; Norwalk, Capt. E. T. Matteson, Engineer —. Sail—J. B. Lozen, Capt. Ed Moore; J. Godfrey, Capt. J. B. Lozen; A. Stewart, Capt. John Destrois; Eleanor, Capt. Frank Dubay; Jennette, Capt. Wm. Dubay; Elvina, Capt. Wesley Brown; Fulton, Capt. Frank Laforge; S. B. Pomeroy, Capt. Wm. Campau.

Anchor Line, E. T. Evans, Manager, Buffalo: Steamers—India, Capt. P. O'Neil; China, Capt. Chas. Christy; Japan, Capt. Jno. Doherty; Alaska, Capt. E. Martin; Wissahickon, Capt. John McCarthy; Delaware, Capt. A. McKenzie; Conestoga, Capt. H. Cronkhite; Lycoming, Capt. L. Wright; Conemaugh, Capt. F. Bloom; Lehigh, Capt. J. H. Berow; Clarion, Capt. Chas. Nelson; Susquehanna, Capt. M. Riley; Codorus, Capt. D. Ryder; Mahoning, Capt. Jos. Corcoran; Schuylkill, Capt. H. O. Miller; Gordon Campbell, Capt. A. Peters; Juniata, Capt. Geo. Delaney.

Minnesota Steamship Co., Pickands, Mather & Co., Managers, Cleveland: Steamers—Maricopa, Capt. G. B. Mallory, Engineer P. J. June; Mariposa, Capt. F. D. Root, Engineer F. A. Smith; Maritana, Capt. C. H. Bassett, Engineer Geo. Arnold; Masaba, Capt. F. Hoffman, Engineer A. L. Wilcox; Marina, Capt. J. W. Morgan, Engineer W. A. Meddaugh; Matoa, Capt. A. P. Chambers, Engineer W. Tyler; Maruba, Capt. F. J. Crowley, Engineer B. F. McCanna; Mariska, Capt. H. Zealand, Engineer P. Canton; Manola, Capt. H. C. McCallum, Engineer D. M. Foster; Schooners—Magna, Capt. John Weeks; Manda, Capt. H. Savage; Martha, Capt. A. J. Talbot; Malta, Capt. H. Culp; Marcia, Capt. E. L. Sawyer.

Calvin & Co., Garden Island, Ont.: Steamers—D. D. Calvin, Capt. A. Malone, Engineer Thos. C. Smith; Armenia, Capt. C. Coons, Engineer Robt. Veech; Bothnia, Capt. G. A. Brien, Engineer Geo. Booth; Reginald, Capt. John Doyle, Engineer John Kennedy; Parthia, Capt. David Lefavne, Engineer Geo. Saune; Chieftain, Capt. Alphonse Cassette, Engineer Thos. Gray; W. Johnston, Capt. David Lefavne, Jr., Engineer, Edward Felix; Bluebell, Capt. John Dix, Engineer —. Sail—Ceylon, Capt. Horatio

Smith; Augustus, Capt. Joseph Achee; Valencia, Capt. John Ferguson; Norway, Capt. James Crosby.

Western Transit Co., Buffalo: Steamers—Arabia, Capt. Robert Murray, Engineer Patrick Welch; Badger State, Capt. F. D. Osborne, Engineer Thos. Lynch; Boston, Capt. Dugald Buie, Engineer Frank Miller; Buffalo, Capt. Patrick Shea, Engineer Wm. McNulty; Chicago, Capt. Frank J. McCabe, Engineer Wm. Libby; Commodore, Capt. Thomas Slattery, Engineer Jas. Brooks; Harlem, Capt. Donald Gilles, Engineer Henry Hess; Hudson, Capt. A. J. McDonald, Engineer Moses Trouton; Milwaukee, Capt. Michael Folan, Engineer John Rainey; Mohawk, Capt. Valentine Jones, Engineer M. J. Laney; Montana, Capt. S. R. Jones, Engineer, Jas. L. Walker; Syracuse, Capt. John Fisher, Engineer J. W. Mark; Vanderbilt, Capt. Neil McCormick, Engineer Fred. Hale.

American Steel Barge Co., Pickands, Mather & Co., Agents, Cleveland: Steamers—Colgate Hoyt, Capt. Neil Campbell, Engineer Gilbert Patterson; J. L. Colby, Capt. M. C. Cameron, Engineer William Densmore; E. B. Bartlett, Capt. Chas. Grant, Engineer Walter Harsant; A. D. Thomson, Capt. John Parke, Engineer John McLaughlin; Thos. Wilson, Capt. William Hoag, Engineer A. J. Smith; Samuel Mather, Capt. Robert Jones, Engineer Alex. McKenzie; J. B. Colgate, Capt. John Dunn, Engineer J. H. Pierce; J. B. Trevor, Capt. M. A. Boyce, Engineer Geo. Blauvelt; Frank Rockefeller, Capt. W. H. Kilby, Engineer Irwin Marshall. Barges—101, Capt. —; 104, Capt. Louis Leonard; 105, Capt. John Sprowell; 107, Capt. Dan McFadyen; 109, Capt. Otis Holdridge; 110, Capt. R. W. Gleason; 111, Capt. G. W. Smith; 115, Capt. Robert Brooks; 116, Capt. Geo. Gallant; 117, Capt. Robert Dunn; 118, Capt. Willard Damon; 126, Capt. Robert Thomson; 127, Capt. Geo. Jorgensen; 129, Capt. Fred W. Green; 130, Capt. W. A. Dick; 131, Capt. E. Emanuelson; 132, Capt. John Nahrstreet; 133, Capt. Alfred Siljander; 134, Capt. James Buer; 137, Capt. Carl D. Secord; 201, Capt. Henry Harris, Jr.; 202, Capt. A. G. McLeod.

Until recently boats for the service of harbor police in the large cities were unheard of in this country, but New York will soon have a fleet of them, and they are of a serviceable kind. The Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, of New York have just been awarded a contract by the New York department of police for two more patrol launches. They are to be similar to the naphtha launches used during the past year in New York, and which were furnished by the same company. The boats are 30 feet long, 7 feet beam and 2 feet 6 inches draft. They are very strongly constructed with oak keel and frames made from steam-bent, straight-grained timbers. The planking is of cedar, copper fastened and rivetted throughout, with decks of white pine. The interior of the hull is finished in ash and oak, natural color of the wood. There is a standing wood roof over entire cockpit, with glass windows forward. The machinery is a six-horse-power naphtha motor.

Rumors concerning the purchase of the Pioneer mine, one of the coming great properties of the Vermillion range, by the Illinois Steel Co., are without foundation. This mine is controlled by Cleveland capital, represented mainly in the office of Oglebay, Norton & Co., and several of the leading stockholders say there is nothing in the reports of a sale. A very large amount of money has been expended in developing the property during the past two or three years, and heavy shipments can be made during the coming season if the market warrants a large output.

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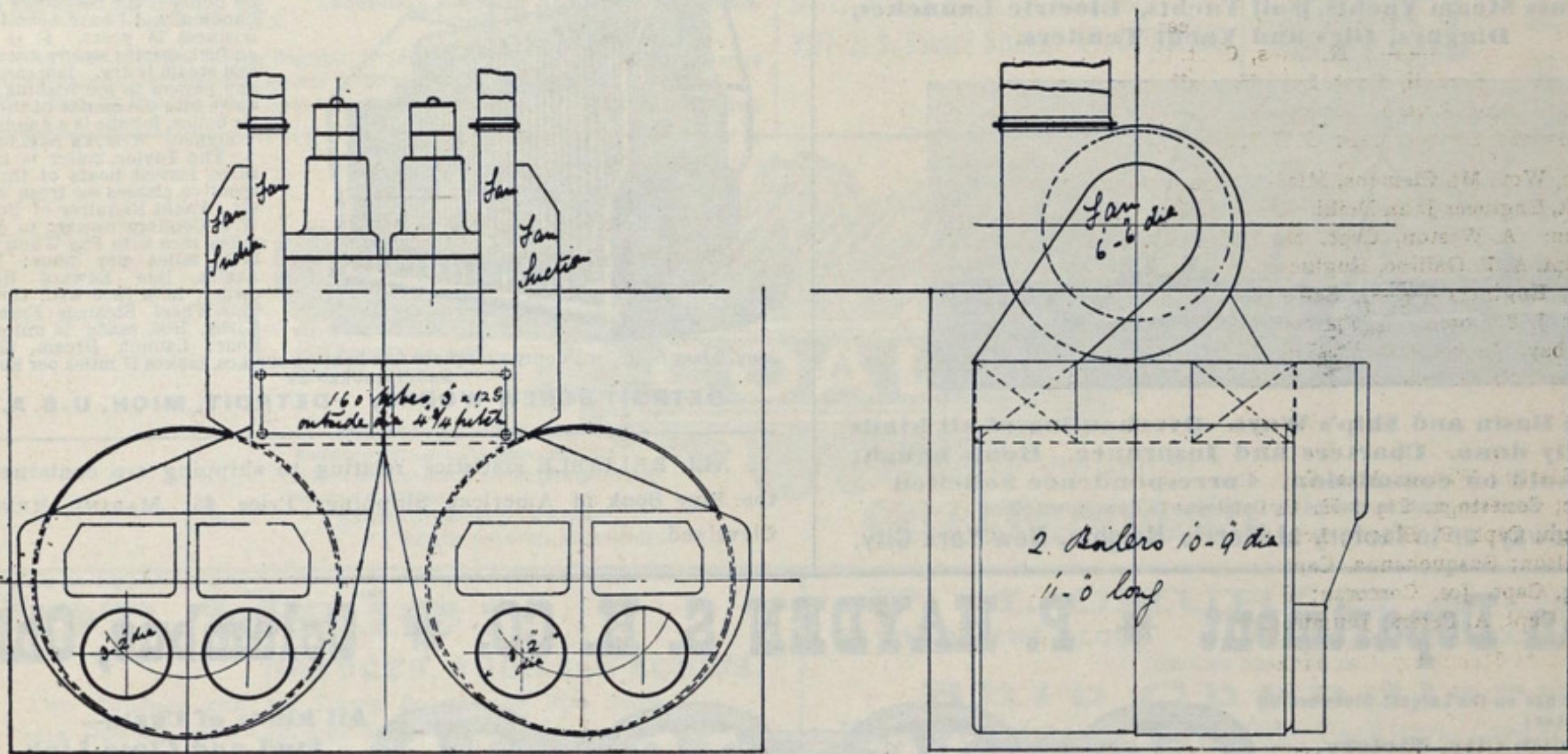
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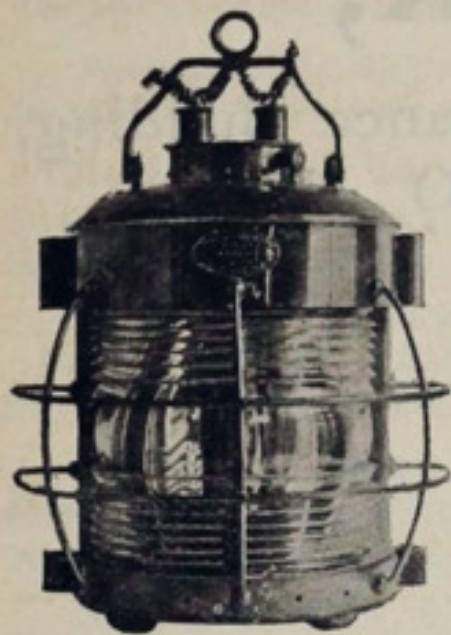
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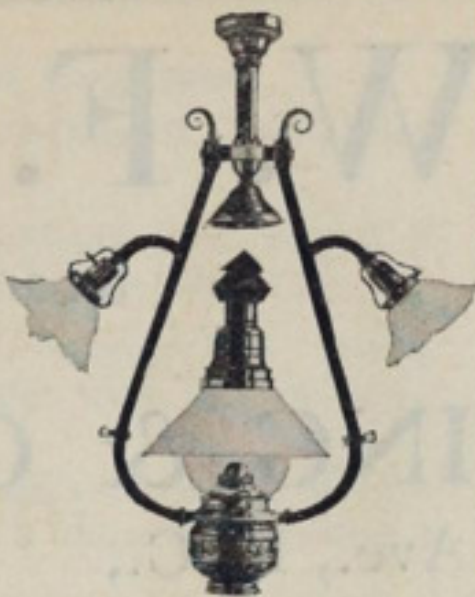
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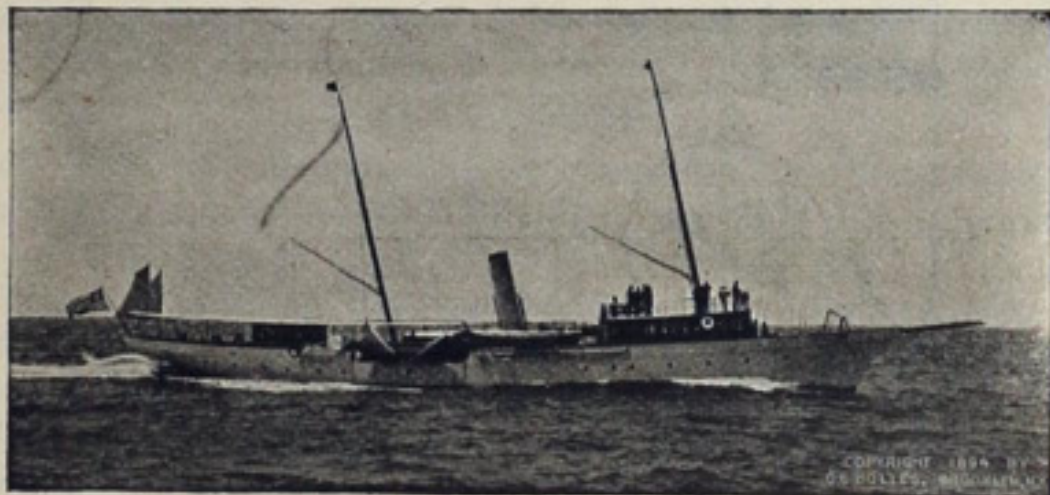
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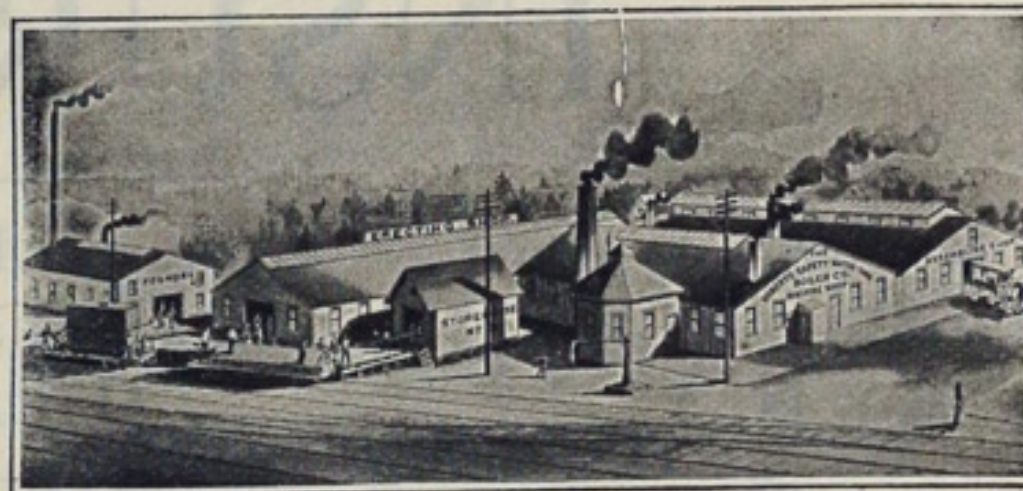
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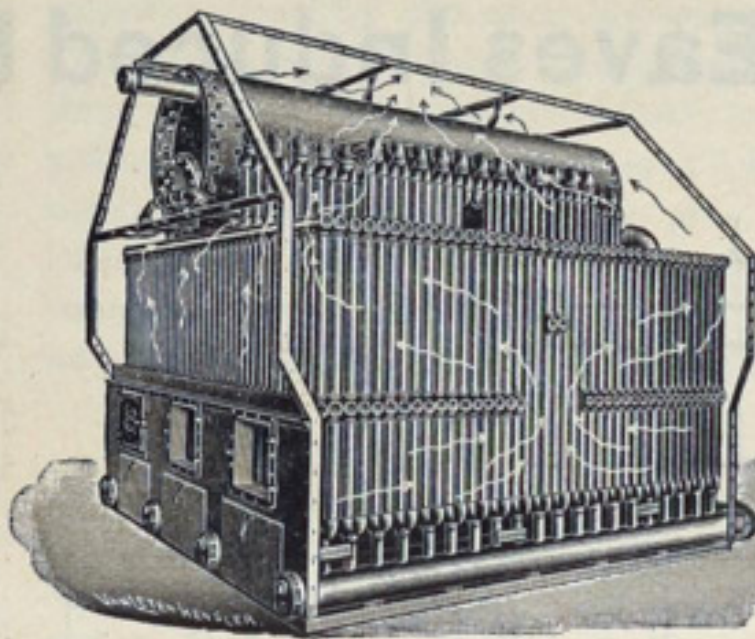
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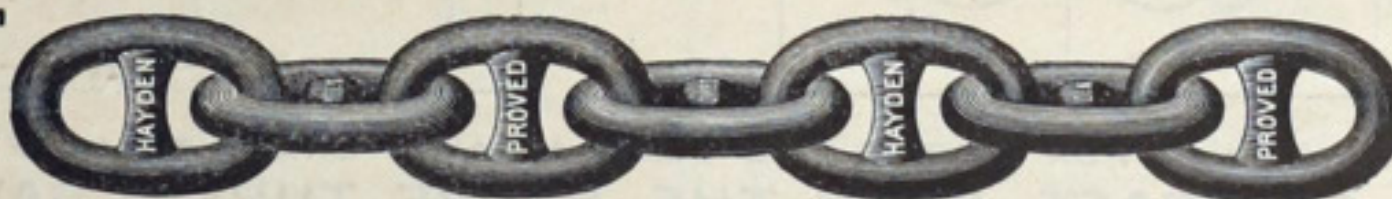
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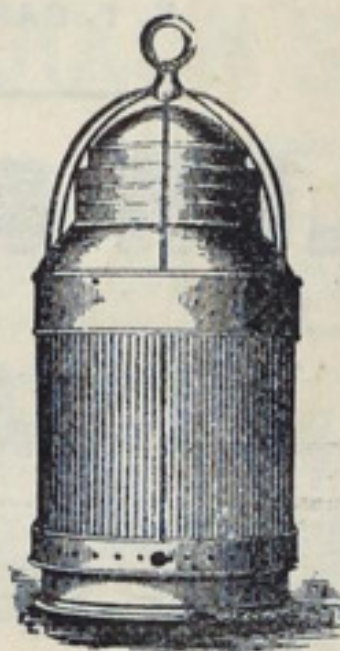
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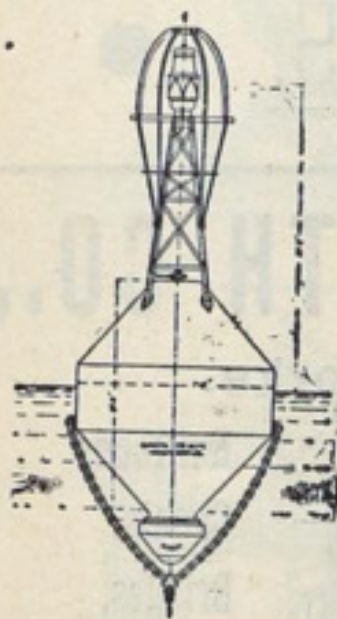
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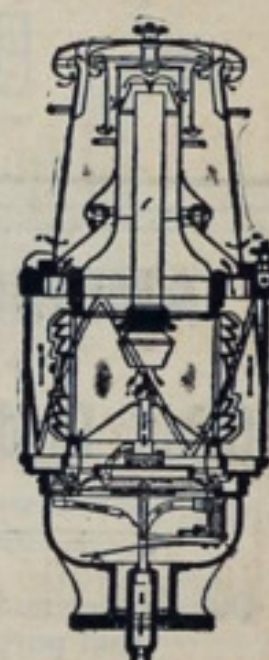
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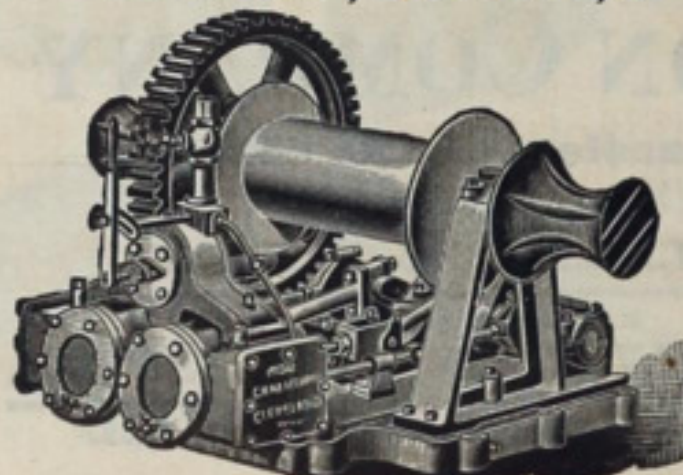
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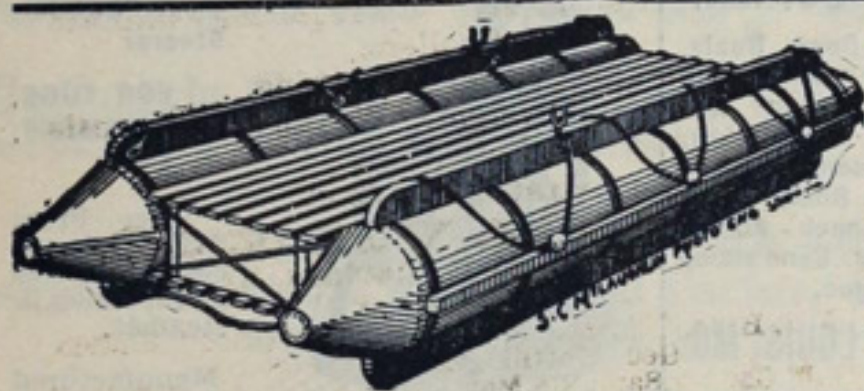
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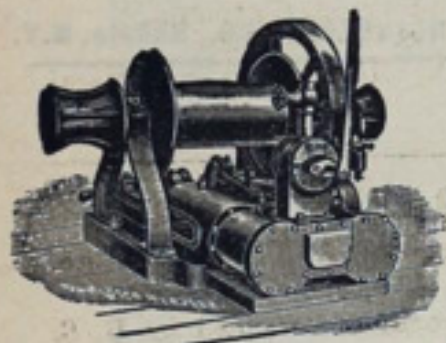
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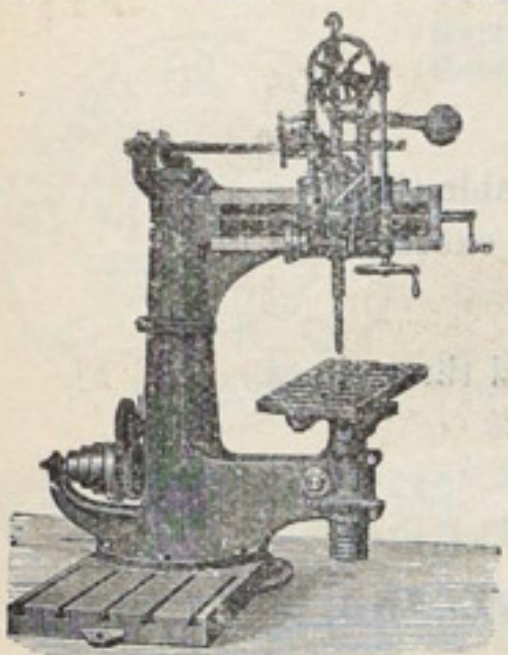
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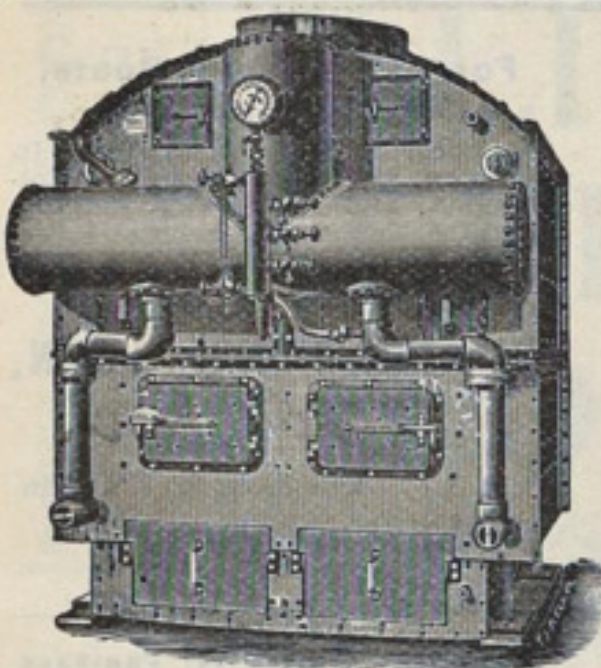
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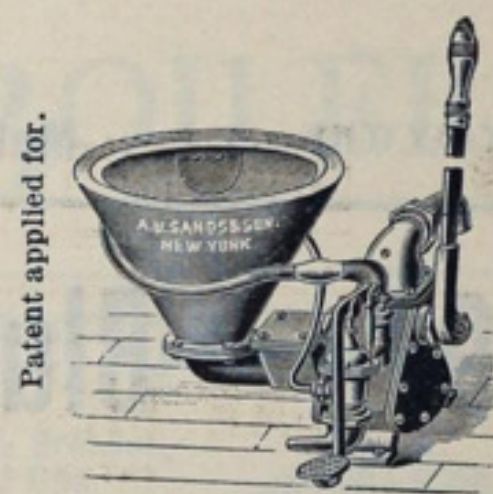
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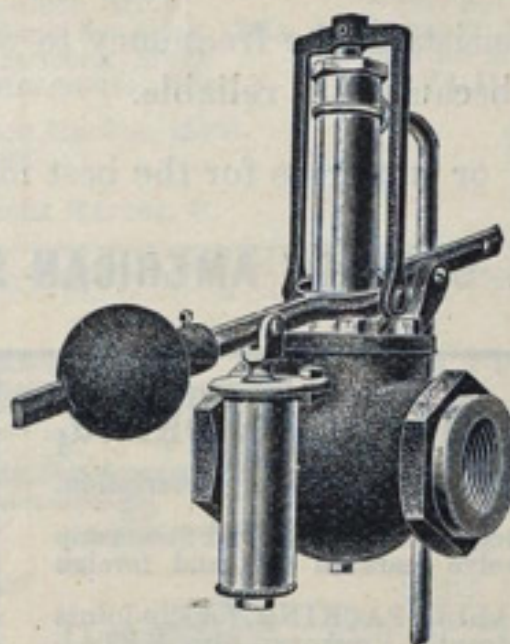
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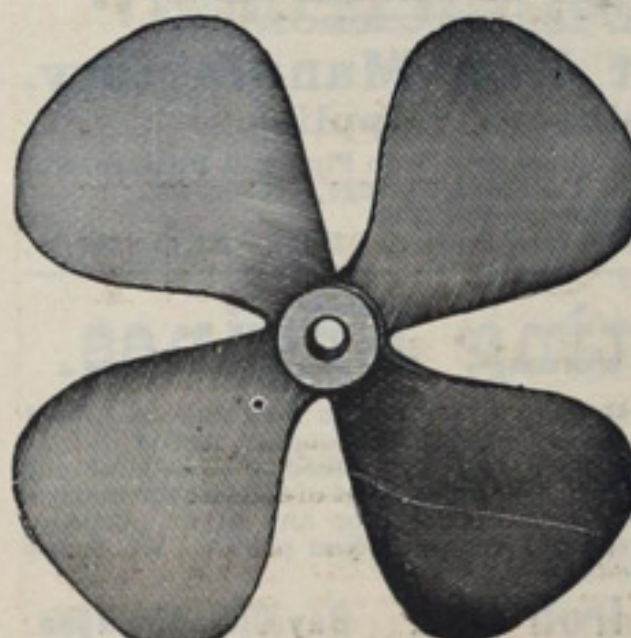
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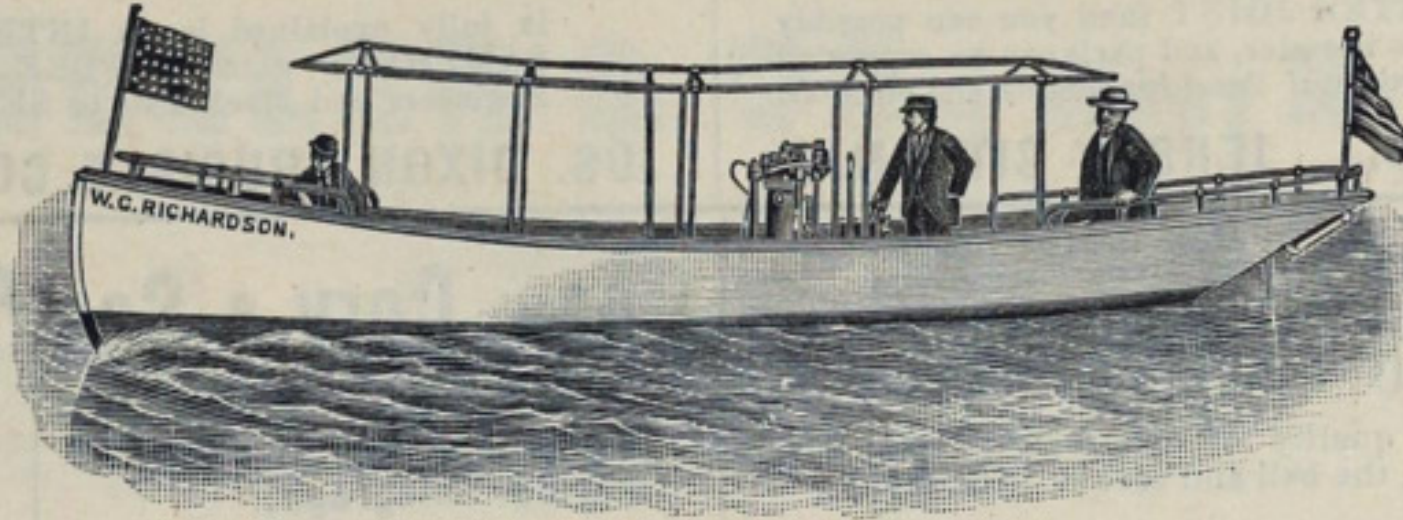


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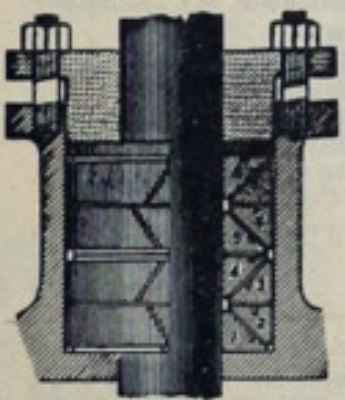
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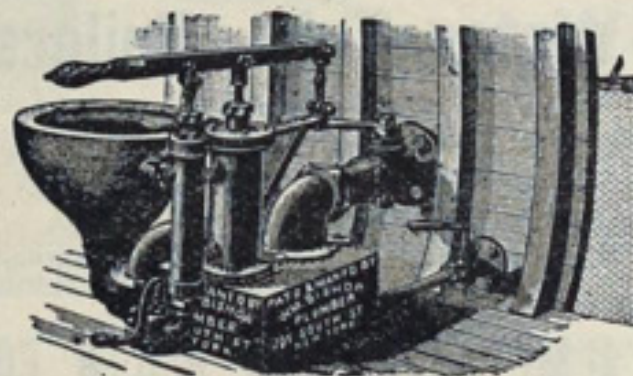
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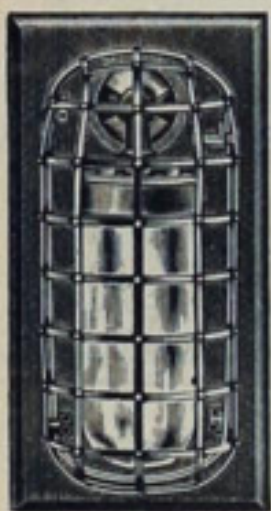
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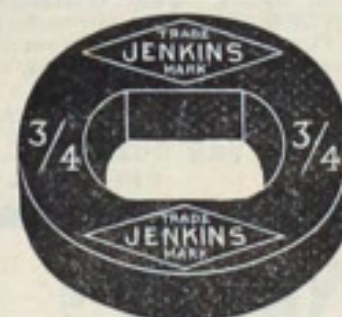


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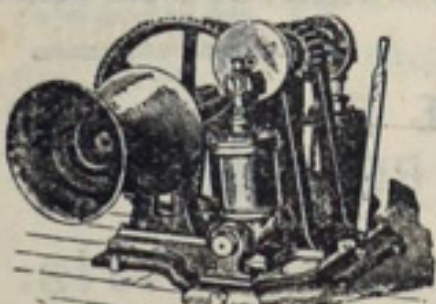
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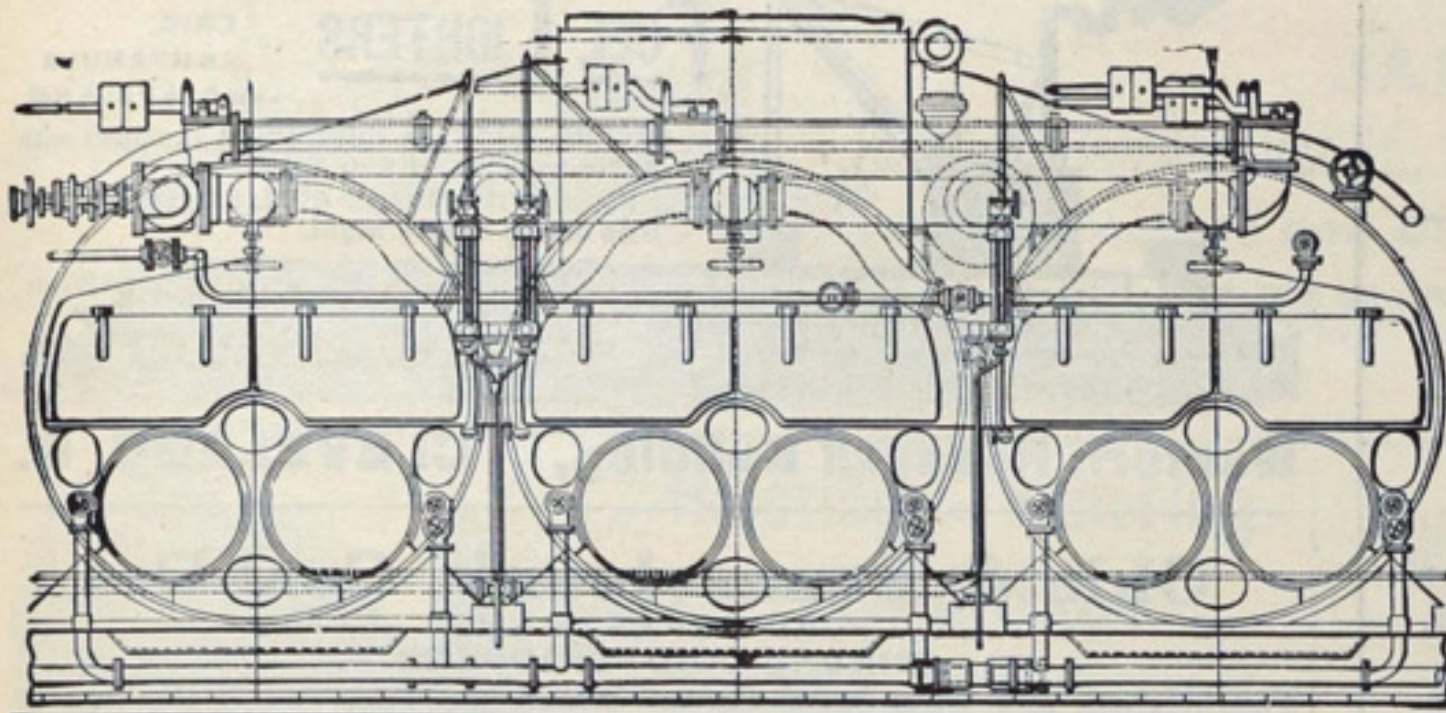
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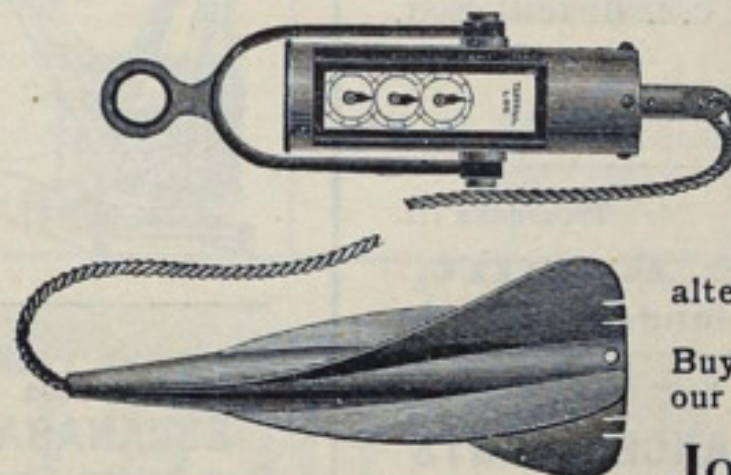


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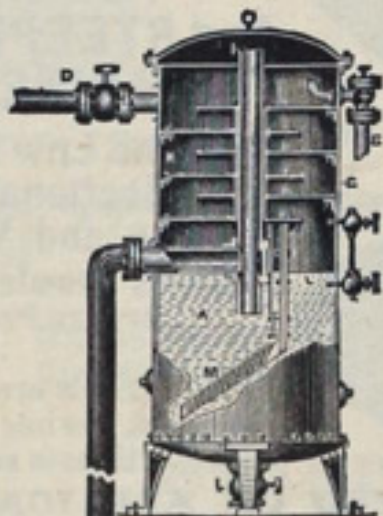
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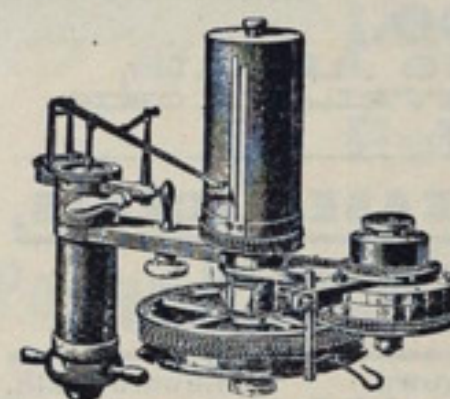
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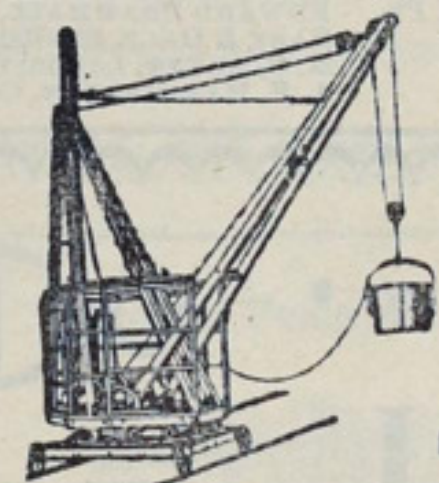
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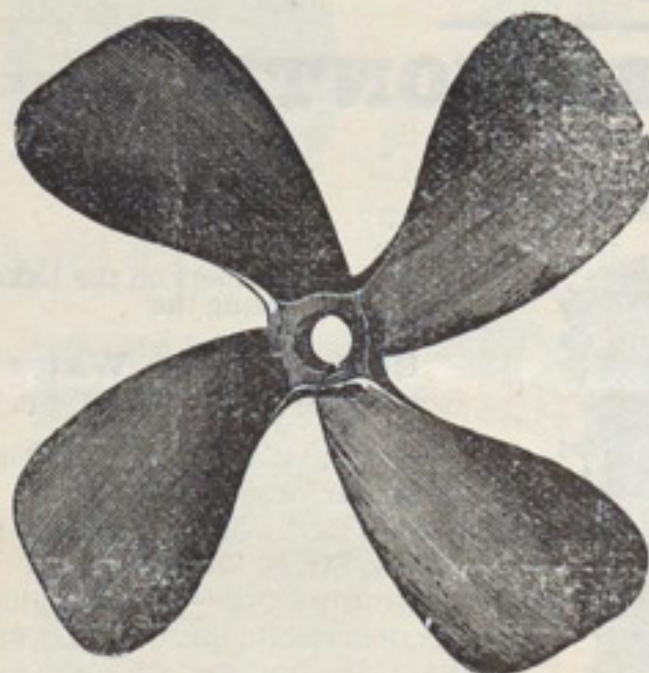
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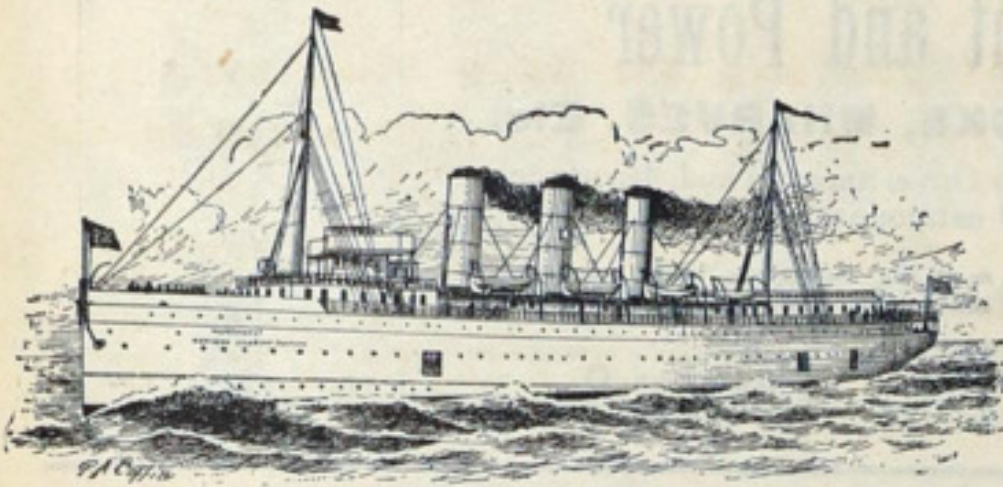
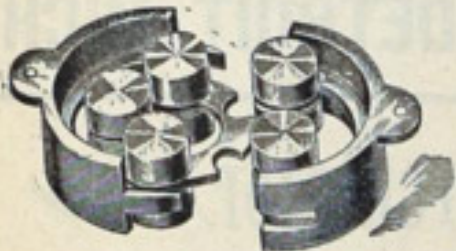
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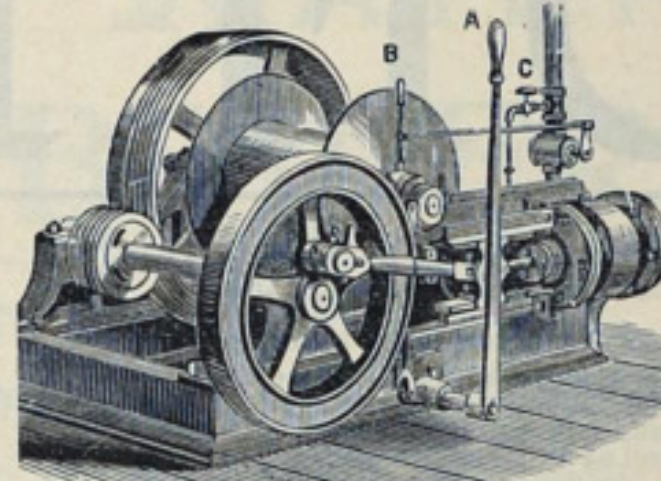
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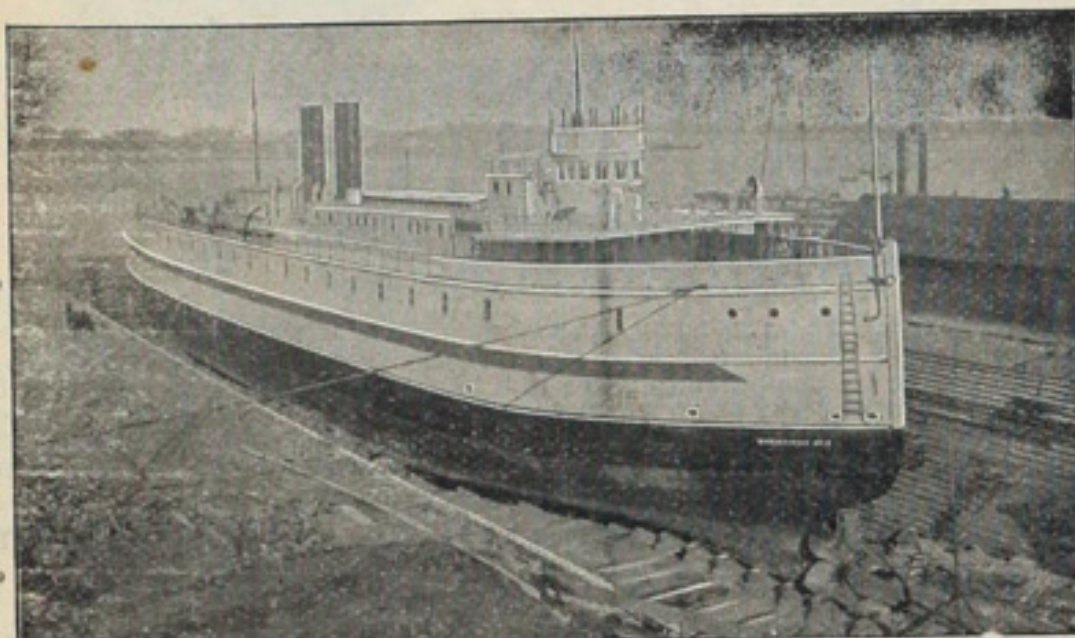
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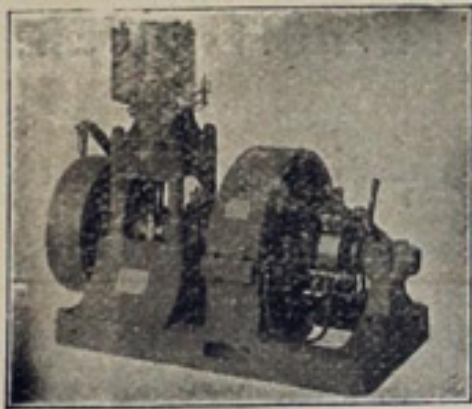
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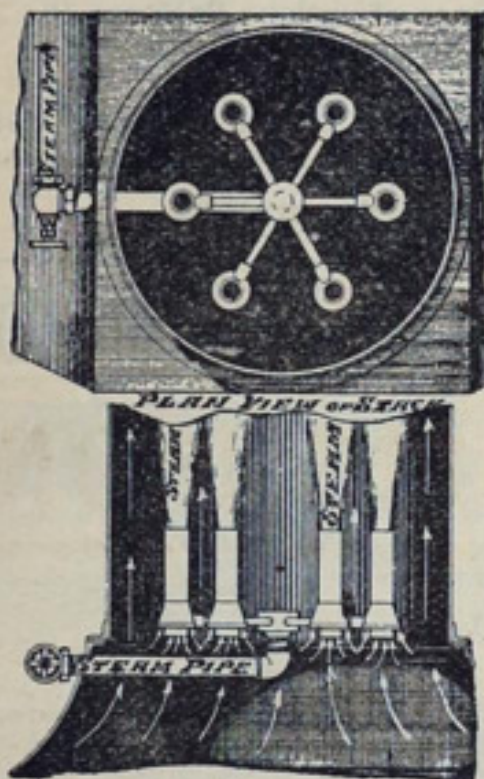
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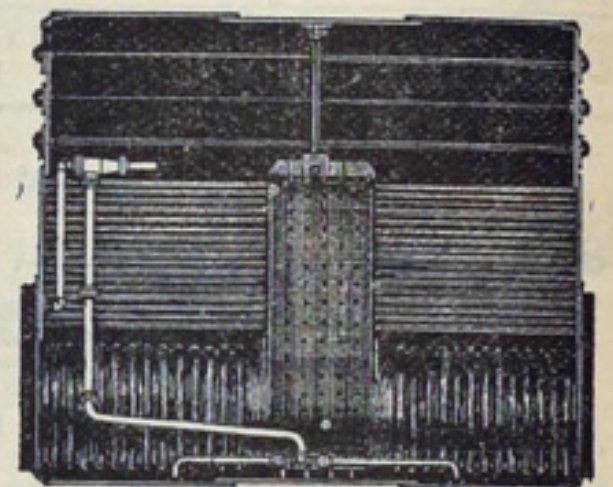
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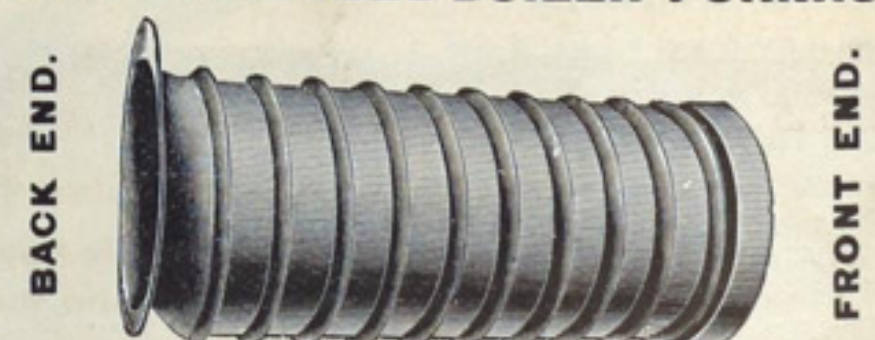
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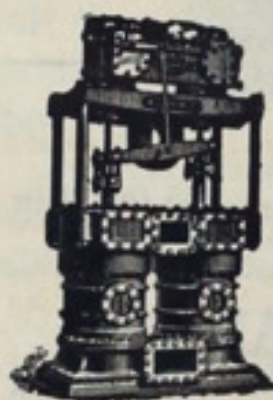
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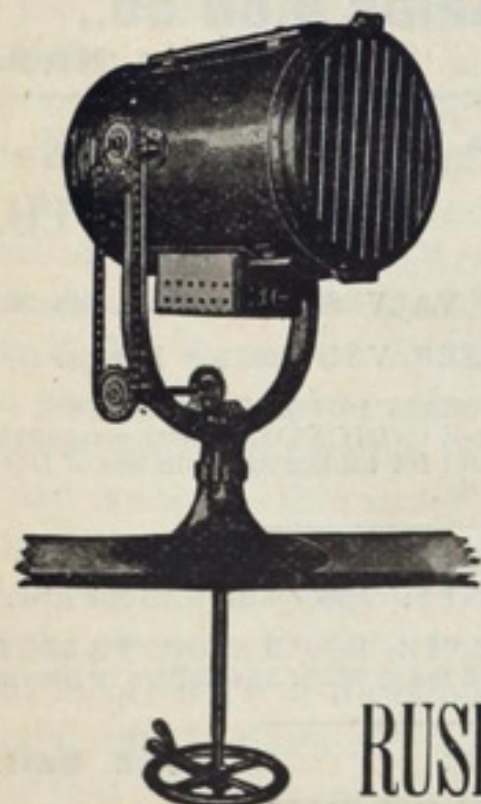
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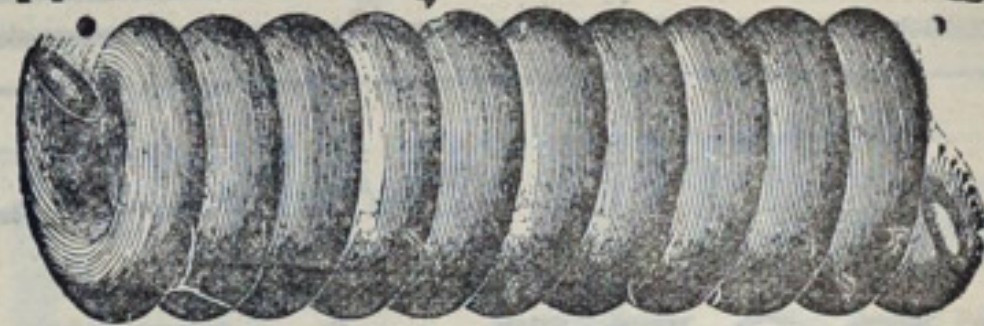
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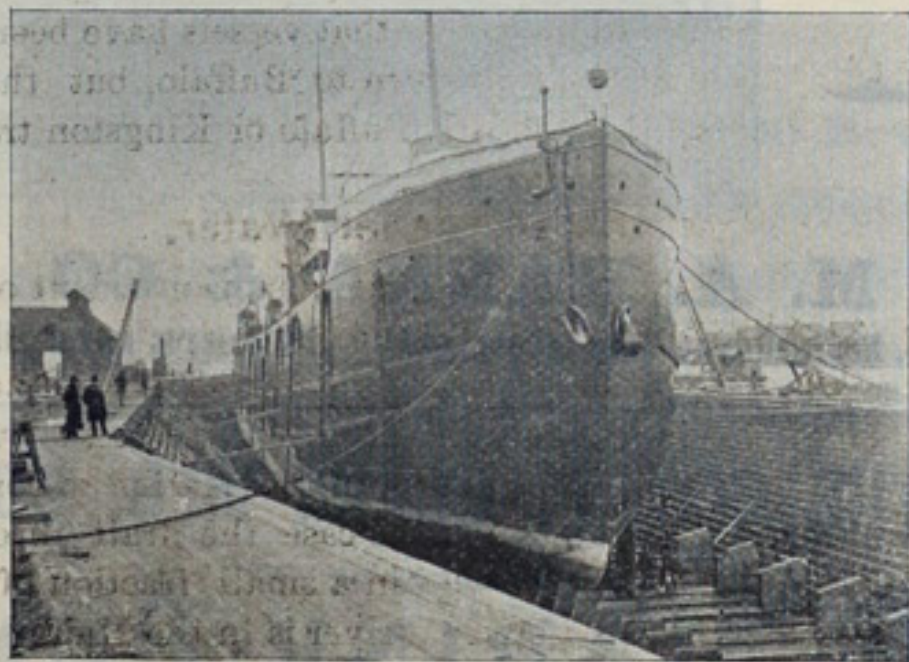
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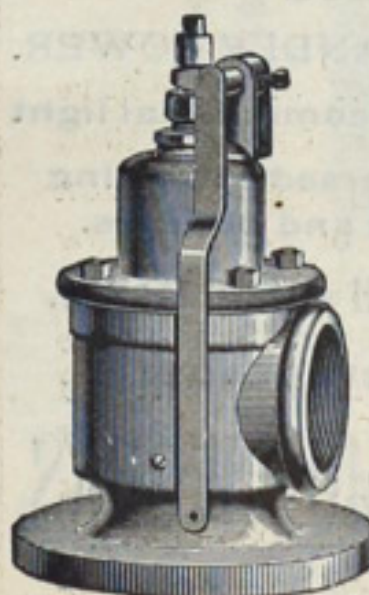
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